IN THE CLAIMS

1. (currently amended) A method for controlling a process, wherein a thickness of a conductive material is altered on a surface of a substrate as a part of the process, the method comprising the steps of:

   (a) contacting the substrate with an electrically conductive solution,

   (b) establishing intermittent electrical continuity between the surface of the substrate and a first electrode,

   (c) establishing electrical continuity between the electrically conductive solution and a second electrode,

   (d) measuring a value of an electrochemical property between the first electrode and the second electrode,

   (e) interpreting the value of the electrochemical property as a measure of the electrical conductivity of the surface of the substrate, and

   (f) controlling the process based on the value of the electrochemical property.

2. (original) The method of claim 1 wherein the electrical conductivity of the surface of the substrate is indicative of the presence of the conductive material on the surface of the substrate.

3. (cancelled) The method of claim 1 wherein the electrical continuity between the surface of the substrate and the first electrode is established intermittently.

4. (original) The method of claim 1 wherein the first and second electrodes are disposed within a rotating pad that contacts the surface of the substrate.

5. (original) The method of claim 1 wherein the first electrode comprises a working electrode in a potentiostat system.

6. (original) The method of claim 1 wherein the second electrode comprises a reference electrode in a potentiostat system.

7. (original) The method of claim 1 further comprising establishing electrical continuity between the electrically conductive solution and a third electrode.

8. (original) The method of claim 7 wherein the third electrode comprises a counter electrode in a potentiostat system.

9. (currently amended) A method for determining an end point of an electrochemical planarization process, where the electrochemical planarization process includes removing at least a portion of a metal layer from a surface of a substrate submerged in an electrolytic solution, the method comprising:

(a) providing a first electrode operable to contact the surface of the substrate,

(b) providing a second electrode operable to contact the electrolytic solution,

(c) intermittently contacting at least the first electrode to the surface of the substrate,

(d) measuring a change in an electrical property between the first and second electrodes as at least the first electrode contacts the surface of the substrate, the change in the electrical property indicative of a change in conductivity of the surface of the substrate, and

(e) controlling the electrochemical planarization process based on the measured change in the electrical property.

10. (original) The method of claim 9 wherein step (d) further comprises measuring a change in an electrochemical potential between the first and second electrodes as at least the first electrode contacts the surface of the substrate.

11. (original) The method of claim 10 wherein step (e) further comprises stopping the planarization process when a substantial increase in the electrochemical potential between the first and second electrodes is measured.

12. (original) The method of claim 9 wherein step (d) further comprises measuring electrical resistance between the first and second electrodes as at least the first electrode contacts the surface of the substrate.

13. (original) The method of claim 12 wherein step (e) further comprises stopping the planarization process when a substantial change in the electrical resistance between the first and second electrodes is measured.

14. (currently amended) The method of claim 9 further comprising:

step (a) including providing the first electrode in a first portion of a surface of a pad;

step (b) including providing the second electrode in the first portion of the surface of the pad, and spaced apart from the first electrode;

step (c) including contacting the surface of the pad to the surface of the substrate;

(f) providing a brush member in a second portion of the surface of the pad, the brush member operable to contact the surface of the substrate;

~~step (c) including contacting the surface of the pad to the surface of the substrate;~~ and

(g) providing relative movement between the surface of the pad and the surface of the substrate as the surface of the pad contacts the surface of the substrate.

15. (original) The method of claim 9 wherein:

step (a) further comprises providing a working electrode of a potentiostat system; and

step (b) further comprises providing a reference electrode of the potentiostat system.

16. (withdrawn/currently amended) An apparatus for determining an end point of an electrochemical planarization process for removing metal from a surface of a substrate submerged in an electrolytic solution, comprising:

(a) a pad having a pad surface for at least intermittently contacting the surface of the substrate,

(b) a first electrode operable to intermittently contact the surface of the substrate,

(c) a second electrode operable to contact the electrolytic solution, and

(d) a voltage sensing circuit coupled to at least the first and second electrodes for sensing a change in the electrochemical potential between the first and second electrodes.

17. (withdrawn) The apparatus of claim 16 wherein the first and second electrodes are disposed on the pad surface.

18. (withdrawn) The apparatus of claim 16 further comprising a controller coupled to the voltage sensing circuit for generating a process control signal for stopping the electrochemical planarization process based on a substantial change in the electrochemical potential between the first and second electrodes.

19. (withdrawn) The apparatus of claim 16 further comprising a third electrode operable to contact the electrolytic solution.

20. (withdrawn) The apparatus of claim 19 wherein:
the voltage sensing circuit comprises a potentiostat;
the first electrode comprises a working electrode coupled to the potentiostat;
the second electrode comprises a reference electrode coupled to the potentiostat; and
the third electrode comprises a counter electrode coupled to the potentiostat.